

Applicants: Allan Green et al.
Serial No.: 09/981,124
Filed : October 17, 2001
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In the Claims

Please amend the claims pursuant to 37 C.F.R. §1.121 as follows:

1-25. (Canceled).

26. (Currently Amended) A transgenic plant comprising a nucleic acid that encodes a plant fatty acid Δ -12 epoxygenase polypeptide and an increased level of epoxy fatty acid in the lipid of its seed relative to the level of the epoxy fatty acid in the seed of the transgenic plant prior to transformation, wherein the epoxy fatty acid is 12,13-epoxy-9-octadecenoic acid, 12,13-epoxy-9,15-octadecadienoic acid, or a mixture of both, and

wherein the plant fatty acid Δ -12 epoxygenase polypeptide comprises the following three histidine-rich regions:

(i) His-(Xaa)₃₋₄-His (SEQ ID NOs: 21 and 22);

(ii) His-(Xaa)₂₋₃-His-His (SEQ ID NOs: 23 and 24); and

(iii) His-(Xaa)₂₋₃-His-His (SEQ ID NOs: 23 and 24),

wherein His designates histidine, Xaa designates any naturally-occurring amino acid, and (Xaa)₃₋₄ refers to a sequence of three or four amino acids, and (Xaa)₂₋₃ refers to a sequence of two or three amino acids, wherein the polypeptide comprises a sequence of amino acids at least 65% identical to the amino acid sequence set forth in SEQ ID NO: 2, 4, 6 or 20, and the polypeptide is other than the polypeptide set forth in SEQ ID NO: 8.

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27. (Previously presented) The transgenic plant of claim 26, wherein the level of 12,13-epoxy-9-octadecenoic acid is greater than 0.7% (w/w) of total seed fatty acid content.
28. (Previously presented) The transgenic plant of claim 26, wherein the level of 12,13-epoxy-9-octadecenoic acid is from 0.9% to 15.8% (w/w) of total seed fatty acid content.
29. (Previously presented) The transgenic plant of claim 26, wherein the epoxy fatty acid is 12,13-epoxy-9,15-octadecadienoic acid.
30. (Cancelled)
31. (Currently Amended) The transgenic plant of claim 26, wherein the plant is *Arabidopsis thaliana*, flax, oilseed rape, sunflower, corn, safflower, soybean, ~~linseed~~, sesame, cottonseed, peanut, olive or oil palm.
32. (Previously presented) The transgenic plant of claim 26, wherein the plant is flax, sunflower, corn, or safflower.
33. (Previously presented) The transgenic plant of claim 31, wherein the plant is flax and the flax is *Linum usitatissimum*.
34. (Previously presented) The transgenic plant of claim 31, wherein the plant is a flax plant containing less than 2% linolenic acid in the lipid of its seed.
35. (Previously presented) A transgenic seed of the plant of claim 26.

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36. (Previously presented) A transgenic seed of the plant of claim 27.
37. (Previously presented) A transgenic seed of the plant of claim 29.
38. (Previously presented) A transgenic seed of the plant of claim 31.
39. (Previously presented) A transgenic seed of the plant of claim 32.
40. (Previously presented) A transgenic seed of the plant of claim 33.
41. (Previously presented) A process for producing the transgenic plant of claim 26 comprising
 - a) transforming a cell or tissue of a plant with a nucleic acid encoding a plant fatty acid Δ -12 epoxygenase under the control of a seed-specific promoter; and
 - b) regenerating the transformed cell or tissue to produce the transgenic plant.
42. (Currently Amended) The process of claim 41, wherein the plant is *Arabidopsis thaliana*, flax, oilseed rape, sunflower, safflower, soybean, ~~linseed~~, sesame, cottonseed, peanut, olive or oil palm.
43. (Previously presented) The transgenic plant of claim 41, wherein the plant is flax, sunflower, corn, or safflower.

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44. (Previously presented) A process for producing 12,13-epoxy-9-octadecenoic acid or 12,13-epoxy-9,15-octadecadienoic acid comprising
- a) obtaining the plant of claim 26;
 - b) separating the seed from the plant; and
 - c) extracting lipid comprising 12,13-epoxy-9-octadecenoic acid or 12,13-epoxy-9,15-octadecadienoic acid from the seed,
- thereby producing 12,13-epoxy-9-octadecenoic acid or 12,13-epoxy-9,15-octadecadienoic acid.
45. (Currently Amended) The process of claim 44, wherein the plant is *Arabidopsis thaliana*, flax, oilseed rape, sunflower, safflower, soybean, ~~linseed~~, sesame, cottonseed, peanut, olive or oil palm.
46. (Previously presented) The transgenic plant of claim 44, wherein the plant is flax, sunflower, corn, or safflower.
47. (Previously presented) A process for producing 12,13-epoxy-9-octadecenoic acid or 12,13-epoxy-9,15-octadecadienoic acid comprising
- a) obtaining the seed of claim 35; and
 - b) extracting lipid comprising 12,13-epoxy-9-octadecenoic acid or 12,13-epoxy-9,15-octadecadienoic acid from the seed,
- thereby producing 12,13-epoxy-9-octadecenoic acid or 12,13-epoxy-9,15-octadecadienoic acid.
48. (Currently Amended) The process of claim 47, wherein the seed is from *Arabidopsis thaliana*, flax, oilseed rape, sunflower, safflower, soybean, ~~linseed~~, sesame, cottonseed, peanut, olive or oil palm.

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49. (Previously presented) The transgenic plant of claim 47, wherein the seed is from flax, sunflower, corn, or safflower.